

Amendments to the Claims:

Please CANCEL claims 11 through 31, without prejudice.

Please ADD new claims 32 through 36.

1. (original) A cooling apparatus for an electronic module, said electronic module having a substantially vertical orientation, said cooling apparatus comprising:

an evaporator with a surface for making thermal contact with said electronic module;

a boiling chamber within said evaporator, said boiling chamber having a plurality of fluid inlet ports disposed proximate one end of said boiling chamber, said boiling chamber having a plurality of fluid outlet ports disposed proximate an opposing end of said boiling chamber; and

a condenser having a plurality of tubes, each of said plurality of tubes being in fluid flow communication with one of said plurality of fluid outlet ports and one of said plurality of fluid inlet ports, said condenser further having a heat exchanger, said heat exchanger having a plurality of thermally conductive fins, each of said plurality of fins being in thermal contact with one or more of said plurality of tubes;

a plurality of check valves, each of said check valves being disposed within a fluid flow path in proximity to one of said boiling chamber inlet ports, each of said check valves being oriented to allow fluid flow from said tube to said boiling chamber while prohibiting fluid flow from said boiling chamber into said tube.

2. (original) The apparatus of claim 1, further comprising a cooling fluid.

3. (original) The apparatus of claim 2, wherein said cooling fluid is selected from the group consisting of water, brine, and dielectric fluids.

4. (original) The apparatus of claim 3, wherein said dielectric fluid is a refrigerant.

5. (original) The apparatus of claim 2, wherein said cooling fluid is at a pressure below atmospheric pressure.

6. (withdrawn) The apparatus of claim 1, further comprising one or more extended heat transfer surfaces in thermal contact with said evaporator surface for making thermal contact with said electronic module.

7. (withdrawn) The apparatus of claim 6, further comprising one or more vapor deflectors disposed proximate at least one of said one or more extended heat transfer surfaces.

8. (withdrawn) The apparatus of claim 1, wherein said boiling chamber edges are rounded in shape.

9. (withdrawn) The apparatus of claim 1, wherein the thickness of said boiling chamber is greater near said fluid outlet ports than near said fluid inlet ports.

10. (withdrawn) The apparatus of claim 2, wherein said plurality of tubes are pitched to improve gravity induced flow of said cooling fluid when said electronic module is oriented other than vertically.

11-31 (canceled)

32. (new) The apparatus of claim 2, wherein:

said boiling chamber includes a portion of said cooling fluid in a liquid state and a portion of said cooling fluid in a vapor state, said liquid cooling fluid partially filling said boiling chamber to a first level; and

said condenser includes a portion of said cooling fluid in a liquid state and a portion of said cooling fluid in a vapor state, said liquid cooling fluid partially filling said condenser to a second level; and

said first level is above said second level.

33. (new) A cooling apparatus for an electronic module, said electronic module having a substantially vertical orientation, said cooling apparatus comprising:

an evaporator with a surface for making thermal contact with said electronic module;

a boiling chamber within said evaporator, said boiling chamber having a plurality of fluid inlet ports disposed proximate one end of said boiling chamber, said boiling chamber having a plurality of fluid outlet ports disposed proximate an opposing end of said boiling chamber; and

a condenser having a plurality of tubes, each of said plurality of tubes being in fluid flow communication with one of said plurality of fluid outlet ports and one of said plurality of fluid inlet ports, said condenser further having a heat exchanger, said heat exchanger having a plurality of thermally conductive fins, each of said plurality of fins being in thermal contact with one or more of said plurality of tubes;

a plurality of check valves, each of said check valves being disposed within a fluid flow path in proximity to one of said boiling chamber inlet ports, each of said check valves being oriented to allow fluid flow from said tube to said boiling chamber while prohibiting fluid flow from said boiling chamber into said tube; and

a cooling fluid, said boiling chamber including a portion of said cooling fluid in a liquid state and a portion of said cooling fluid in a vapor state, said liquid cooling fluid partially filling said boiling chamber to a first level, said condenser including a portion of said cooling fluid in a liquid state and a portion of said cooling fluid in a vapor state, said liquid cooling fluid partially filling said condenser to a second level, wherein said first level is above said second level.

34. (new) The apparatus of claim 33, wherein said cooling fluid is selected from the group consisting of water, brine, and dielectric fluids.

35. (new) The apparatus of claim 34, wherein said dielectric fluid is a refrigerant.

36. (new) The apparatus of claim 33, wherein said cooling fluid is at a pressure below atmospheric pressure.